

What is claimed is:

- 1 1. An apparatus comprising:
2 a threshold detector having a current comparator to
3 determine if an input signal exceeds a threshold.

- 1 2. The apparatus of claim 1, wherein the threshold
2 detector comprises a differential amplifier stage having an
3 input stage comprising a first transistor and a second
4 transistor having collectors and emitters coupled together.

- 1 3. The apparatus of claim 2, wherein the
2 differential amplifier stage has a reference stage having a
3 third transistor and a fourth transistor, the third and
4 fourth transistors having emitters coupled to the emitters
5 of the first and second transmitters.

- 1 4. The apparatus of claim 3, wherein the reference
2 stage is coupled to receive a voltage reference from a half
3 differential amplifier stage.

- 1 5. The apparatus of claim 4, further comprising a
2 current source to bias the reference stage and a limiting
3 amplifier coupled to the threshold detector.

1 6. The apparatus of claim 1, wherein the threshold
2 detector is coupled to detect a loss of a received signal
3 input into a limiting amplifier.

1 7. The apparatus of claim 6, wherein the received
2 signal is derived from a high frequency optical signal.

1 8. The apparatus of claim 6, wherein the threshold
2 detector is coupled to detect an absolute value of a
3 differential stage output of the limiting amplifier.

1 9. The apparatus of claim 2, further comprising
2 cross-coupled transistors coupled between the input stage
3 and a resistor load to provide a feedback gain to the input
4 stage.

1 10. An apparatus comprising:
2 a first Schmitt trigger having an output coupled to an
3 input of a second Schmitt trigger to generate hysteresis.

1 11. The apparatus of claim 10, wherein the first
2 Schmitt trigger includes a first differential amplifier
3 having an inverting input coupled to receive an input
4 signal and a non-inverting input coupled to receive an
5 output of the second Schmitt trigger.

1 12. The apparatus of claim 11, wherein the second
2 Schmitt trigger comprises a second differential amplifier
3 having an inverting input coupled to receive an output of
4 the first differential amplifier.

1 13. The apparatus of claim 10, further comprising a
2 first voltage divider coupled to the output of the first
3 Schmitt trigger.

1 14. The apparatus of claim 13, wherein the input of
2 the second Schmitt trigger is coupled to a node between a
3 first resistor and a second resistor of the first voltage
4 divider.

1 15. The apparatus of claim 10, wherein the output of
2 the first Schmitt trigger is a fixed percentage of an input
3 signal of the first Schmitt trigger.

1 16. The apparatus of claim 10, wherein the output of
2 the first Schmitt trigger is based upon a threshold level
3 for a loss of received signal of an optical communication
4 system.

1 17. A method comprising:
2 determining an absolute value of a differential input;
3 and

4 comparing the absolute value to a reference signal
5 using a current comparator.

1 18. The method of claim 17, further comprising
2 providing a common mode direct current feedback signal to a
3 current source.

1 19. The method of claim 17, further comprising
2 providing an output of the current comparator that is
3 indicative of a loss of received signal of an optical
4 communication system.

1 20. The method of claim 17, further comprising
2 receiving the differential input from a limiting amplifier.

1 21. A system comprising:
2 a threshold detector having a current comparator to
3 determine if a signal representing an incoming optical
4 signal exceeds a threshold; and
5 an optical fiber coupled to provide the incoming
6 optical signal.

1 22. The system of claim 21, further comprising a
2 limiting amplifier coupled between the optical fiber and
3 the threshold detector.

1 23. The system of claim 22, wherein the threshold
2 detector is coupled to detect an absolute value of a
3 differential stage output of the limiting amplifier.

1 24. The system of claim 21, wherein the threshold
2 detector comprises an input stage and a reference stage,
3 the input stage and the reference stage comprising a
4 plurality of transistors having emitters coupled together.

1 25. The system of claim 24, further comprising a
2 current source to bias the reference stage and a limiting
3 amplifier coupled to the threshold detector.

1 26. An apparatus comprising:
2 an output buffer amplifier having positive feedback to
3 boost gain.

1 27. The apparatus of claim 26, wherein the output
2 buffer amplifier includes cross-coupled transistors to
3 provide the positive feedback.

1 28. The apparatus of claim 26, wherein the output
2 buffer amplifier comprises a level shifter.

1 29. The apparatus of claim 26, wherein the output
2 buffer amplifier includes a pair of Darlington circuits.